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DIVERSIFIED FARMING UNDER THE PLANTATION SYSTEM.

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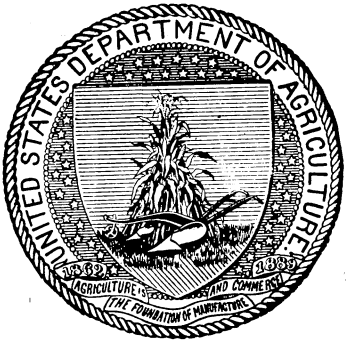

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U. S. DEPARTMENT OF AGRICULTURE,
BUREAU OF PLANT INDUSTRY,
OFFICE OF THE CHIEF,
Washington, D. C., May 8, 1907.

SIR: I have the honor to transmit herewith a paper entitled "Diversified Farming under the Plantation System" and to recommend that it be published as a Farmers' Bulletin.

This paper was prepared, under the direction of the Agriculturist in Charge of the Farm Management Investigations of this Bureau, by Mr. D. A. Brodie and Mr. C. K. McClelland, who have conducted careful investigations on this subject for several years past.

Respectfully,

B. T. GALLOWAY,
Chief of Bureau.

Hon. JAMES WILSON,
Secretary of Agriculture.

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DIVERSIFIED FARMING UNDER THE PLANTATION SYSTEM.

INTRODUCTION.

At sundry times and at various places much of the farm land of this country has been devoted to the growing of one particular crop. If for a series of years a certain crop brings a high price, many farmers are likely to plant large areas of that crop, and often the entire farm is given over to it. Again, certain soils in certain climates lend themselves peculiarly to the best development of a certain crop, and here also the entire acreage is likely to be in that particular crop.

Without disputing the good points of such practice, such as the profits secured at times, the possibility of establishing a reputation for a certain product, the thorough knowledge obtained of a particular crop and its peculiarities, and the small equipment of machinery required for it, it is only necessary to point out some of the evil results of the system in order to convince most people of its harmfulness.

One result of the continued cultivation of a single crop is the infection of the soil with spores of fungous diseases peculiar to the plant grown. The practice also results in a rapid depletion of soil fertility. In unfavorable years—years of frost, of drought, of much rain, of insect attacks, or of very low prices—the farmers who depend upon one crop are brought to a realization of the value and the necessity of diversification.

In the United States there have been many examples of this lack of diversification, and also many examples of the resulting evils. In the Central States corn was grown for many years on the same soil until low prices and low yields compelled the farmers to diversify. In the North and the Northwest wheat was, and in many places is still, almost the only crop grown. Many farmers who depended upon it alone went out of business during several successive unfavorable periods. Similar results have been observed at various times with cotton, sugar cane, rice, potatoes, hops, grapes, peaches, apples, onions, and other crops. Just recently a disease has been found upon melons which may make it more profitable to grow some other

crop for a few years. There is also a root-rot appearing upon radishes which may necessitate the abandonment of that crop upon infected soils. So, also, the ravages of the boll weevil are compelling the southern farmer to diversify. If the boll weevil causes both the upland and the bottom-land farmers of the South to diversify and rotate their crops, it will prove to be not an unmixed evil.

Upland farmers take more readily to diversification and rotation than do the river-bottom planters, and for several reasons. In the first place their soils are poorer, and a rotation of crops is imperative in order to obtain any reasonable yield, while the bottom soils have such a mine of fertility in and beneath them that it is often many years before there is any noticeable decrease in yield, even where only one crop is grown. The average number of acres to the owner is less on the hill than on the bottom land and the tenants are fewer in number. The hill farmers usually live upon their farms, while the bottom-land planters as a rule reside in town, where it is impossible for them to keep an eye upon all the details of a diversified system of farming. Besides being in a position to better oversee the work, the hill farmers also do more of their own work, and this is an important factor in diversification. It can hardly be expected that a class of tenants whose crop of cotton often grows in spite of, rather than because of, them will make a success of live stock, truck, or fruit growing—complex industries which require a more thorough knowledge of scientific agriculture. After tenants have been instructed how to handle such products and have become accustomed to them there will be less difficulty in planning for diversification. The bottom-land planters usually keep only enough live stock to carry on the work of the plantation, while it is no uncommon thing to find a hill farm with twenty to thirty head of cattle, an equal number of swine, and several head of mule or horse colts. The keeping of live stock necessitates growing more forage crops; consequently more of the total acreage of the farm must be devoted to the raising of this feed. These forage crops are fed to the live stock, and the manure is returned to the soil, thus preserving its fertility.

The planters maintain that because of the roving tendency of the tenant class they can not plan for diversified farming. This roving is partly due to the desire of the tenant to better himself, each man wanting to work where he can make the most money. In the two examples cited later the planters say that to hold their tenants all they have to do is to show that the tenants can make more on that particular plantation than upon any other. The planters do this by encouraging their men to fix up their homes, so that they will be homes in the true sense of the word, to grow as much as possible upon their holdings of what they need to eat, to keep more or less

live stock, and to raise forage for that stock. And then the planters advise them to grow such crops as will bring in money at various seasons of the year. It is no trouble to hold a tenant with such surroundings and with another pay day only a few weeks ahead, but it is very easy to lose one when there is only an annual pay day, as is the case when cotton is the only money crop.

One of the main reasons for this lack of diversification is the lack of forehandedness among the tenant class and the disinclination of the planters and the merchants to lend money or supplies on anything but cotton. This is because cotton is "tangible." A dishonest tenant can dispose of eggs, butter, grain, pork, hay, or truck without the knowledge of his creditor, but a cotton bale is too large to escape undetected, and especially so as the planter gets a record of it as it passes through the gin. Unfortunately, it is true that most of the merchants do not want to abolish the credit system. It is to their advantage to continue it, and some of them fail to see that the entire country is held back because of it.

Many of the planters affirm that there is no money in anything but cotton, but this has been proved a fallacy. At the present prices of pork and the cheapness of producing it in the South, and at the present prices of hay and other forage, of cowpeas for seed, of good cows, of truck, and of mules, money can be made in diversified farming.

The planters are held in a system fixed by their predecessors. This system was a development through a series of years of very peculiar conditions, a development in which few of the present planters played a part, but resulting in a system from which many of them do not care to depart and do not know how to depart. This paper is intended to show those who may desire to change their methods how other men have started in the work of diversification.

Mr. F. M. Greene, of Atlanta, Tex., instructs each of his tenants to devote a few acres each year to Irish potatoes, and then, by digging all at the same time, a carload is obtained for shipment. Later in the summer cabbages are planted on this land, to come off in January and February. This last winter (1906–7) a profit of $150 an acre was realized on the cabbage crop. This is a simple system of diversification, but it gives the men three money crops at three different times of the year.

AN EXPERIMENT IN DIVERSIFIED FARMING.

In 1906 the Louisiana Agricultural Experiment Station and the United States Department of Agriculture began some diversification work with the tenants on the Rosalie Plantation at Moreland, La.,

owned by Mr. William Polk, of Alexandria, La. Mr. Henry Easterbrook, of Pineville, La., had direct charge of this work, under the supervision of the Office of Farm Management Investigations of the Bureau of Plant Industry.

Each tenant set aside for this experiment nearly 2 acres of land, on which he planted potatoes, watermelons, sweet corn, and cabbage—approximately one-half acre of each. These crops were planted at the same time by all of the tenants, so as to be ready for harvest at the same time upon all of the fields.

Because of poor seed and excessive rainfall in the early spring the corn crop was very poor. In four instances it was a complete failure, while in the others there was an insufficient quantity for marketing, and it was therefore fed to stock upon the place. From May 6 until June 26, 1906, there was no rain, and because of this the cabbage crop was also a failure. One tenant, A. Palmer, planted sweet potatoes when the corn and cabbage failed. These yielded at the rate of 271 bushels to the acre. Half of the crop was sold at prices ranging from 50 cents to a dollar per bushel, the average price being 60 cents. The other half was kept for family use.

The Irish potato crop was decidedly a success, as shown by Table 1, only one tenant reporting a failure:

TABLE 1.—*Potato crop, 1906, of tenants on the plantation of William Polk, near Moreland, La.*

Serial No.	Name of tenant.	Area planted.	Yield of the plot.	Yield to the acre.	Gross receipts.	Expenses to the acre.					Net profit.	Loss.	Net profit to the acre.
						Fertilizers.	Seed.	Bags.	Rent.	Total.			
		Acres	*Bush.*	*Bush.*									
1	H. Edwards	2 4/5	31	107 5/14	$27.90	$6.88	$6.88	$1.26	$0.73	$17.75	$12.15	.....	$42.02
2	N. Dixon	1/3	40	106 2/3	36.00	3.44	6.88	1.68	.94	12.94	23.06	.....	61.49
3	J. Crawford	1/3	34 1/4	103 1/2	31.13	3.44	6.88	1.40	.84	12.56	18.57	.....	55.71
4	J. Brown	1/2	47 7/10	95 3/5	42.93	3.44	6.88	1.75	1.25	13.32	29.61	.....	59.22
5	G. Mason	1/2	43 1/2	86 1/7	38.85	3.44	6.88	1.75	1.25	13.32	25.53	.....	51.06
6	J. Chase	1/2	41 1/2	82 1/7	37.14	3.44	6.88	1.68	1.25	13.25	23.89	.....	47.78
7	T. Grimble	1/2	36 1/2	72 1/7	32.55	3.44	6.88	1.40	1.25	12.97	19.58	.....	39.16
8	A. Figgins	1/2	35 7/12	71 11/20	28.43	3.44	6.88	1.33	.94	12.59	15.84	.....	41.24
9	W. Odom	1/2	34 3/5	69 1/5	31.35	3.44	6.88	1.47	1.25	13.04	18.31	.....	36.62
10	I. Carey	1/2	31 1/2	63	28.35	3.44	6.88	1.33	1.25	12.90	15.45	.....	30.90
11	T. Jefferson	1/2	30 1/2	68	27.83	4.13	6.88	1.19	1.13	13.33	14.50	.....	32.63
12	H. Thompson	1/2	28 7/12	57 1/6	25.73	3.44	6.88	1.26	1.25	12.83	12.90	.....	25.80
13	A. Williams	1/2	28 1/2	56 1/7	25.43	4.13	6.88	1.33	1.25	13.59	11.84	.....	23.68
14	S. Goodman	1/2	26 3/4	53 1/2	24.00	3.44	6.88	1.12	1.25	12.69	11.31	.....	22.62
15	S. Money	1/2	25 5/12	50 5/6	23.03	3.44	6.88	1.05	1.25	12.62	10.41	.....	20.82
16	P. Thompson	1/2	21 1/4	43 1/2	19.58	3.44	6.88	.91	1.25	12.48	7.10	.....	14.20
17	A. Palmer	1/2	19 3/4	39 1/2	17.70	3.44	6.88	.84	1.25	12.41	5.29	.....	10.58
18	E. Brown	1/2	3 11/12	7 11/12	3.53	3.44	6.88	.14	1.25	11.71	.....	$8.18	.....
	Total	8 1/3	556 13/20	1,234 7/24	501.46	66.74	123.84	22.89	20.83	234.30	275.34	8.18	.....
	Average, including No. 18	.....	.....	61. 1/2	.....	.....	.....	.....	.....	28.20	.....	.....	32.10
	Average, excluding No. 18	.....	.....	70. 1/2	.....	.....	.....	.....	.....	.....	.....	.....	35.20

It will be seen that the net profits to the acre on the crop of Irish potatoes varied from $10.58 to $61.49, averaging $32.10, including the one failure. The yields varied from nearly 8 to 107 bushels to the

acre, averaging 61⅛ bushels. If, however, the one failure is not taken into consideration, an average yield of 70½ bushels and an average profit of $35.20 to the acre are shown. These potatoes were dug on May 21 and 22, 1906, and sold in the car at 90 cents a bushel. The yields would have been larger but the price lower had they been dug one week later. In addition to this crop of potatoes with profits of over $30 per acre, it would have been possible to have grown afterwards a good crop of Mexican June corn, or cowpeas, or other crops upon this same land and to have followed these by some winter crop.

When it is considered that none of these tenants had ever before grown Irish potatoes and had to be instructed in their cultivation from the very beginning, the possibilities open to them in the future as they become more familiar with the crop can be seen.

The watermelons were sold in Alexandria and other neighboring towns as they matured, bringing an average of 7 cents each. Watermelons grown upon bottom lands are poorer in quality than those produced upon the hill lands, and bring less upon the market. One load of these melons was sold on the State camp grounds, but the demand for them was slight because of their poor quality. It will be seen from Table 2 that the yields varied from 0 to 600 melons to the acre, averaging about 300 per acre for the 15 productive plots recorded. The results in money varied from a loss of $4.54 on half an acre to a gain at the rate of $85.83 to the acre, the average profit being $25.41.

TABLE 2.—*Watermelon crop, 1906, of tenants on the plantation of William Polk, near Moreland, La.*

Name of tenant.	Number grown to the acre.	Area.	Expenses to the acre.				Gross receipts.	Net profit.	Loss.	Net profit to the acre.
			Fertilizer.	Seed.	Rent.	Total.				
		Acres.								
T. Grimble	600	8/13	$2.06	$1.02	$1.80	$4.88	$57.70	$52.82	.....	$85.83
P. Thompson	600	½	2.06	1.02	1.46	4.54	39.00	34.46	.....	68.92
W. Odom	450	8/13	2.06	1.02	2.03	5.11	34.50	29.39	.....	42.45
S. Goodman	400	8/13	2.06	1.22	1.35	4.63	23.85	19.22	.....	41.64
I. Carey	410	11/28	2.06	1.02	1.24	4.32	17.50	13.18	.....	31.15
G. Mason	300	8/13	2.06	1.02	2.03	5.11	25.00	19.89	.....	28.73
N. Dixon	280	½	2.06	1.02	1.46	4.54	18.50	13.96	.....	27.92
A. Figgins	260	½	2.06	1.02	1.46	4.54	17.50	12.96	.....	25.92
J. Chase	240	½	2.06	1.02	1.46	4.54	16.50	11.96	.....	23.92
S. Money	220	½	2.06	1.02	1.46	4.54	15.40	10.86	.....	21.72
J. Crawford	214	11/18	2.06	1.02	1.79	4.87	18.00	13.13	.....	21.48
A. Williams	200	½	2.06	1.02	1.46	4.54	14.75	10.21	.....	20.42
J. Brown	225	½	2.06	1.02	1.46	4.54	10.60	6.06	.....	12.12
H. Edwards	103	7/18	1.04	1.02	1.17	3.23	6.30	3.07	.....	7.68
H. Thompson	(a)	17/36	2.06	1.02	1.91	4.99	8.40	3.41	.....	5.21
T. Jefferson	27	1/18	2.06	.81	.59	3.46	4.00	.54	.....	2.70
A. Palmer	0	½	2.06	1.02	1.46	4.54	.....	.....	$4.54	.....
E. Brown	0	½	2.06	1.02	1.46	4.54	.....	.....	4.54	.....
Total	4,529	9¼	36.06	18.35	27.05	81.46	327.50	255.12	9.08	467.81
Average for the 15 plots recorded	300	.....	.....	.....	.....	.....	.....	.....	.....	25.41

[a] No record.

The figures in Tables 1 and 2 include the rent of the land and the cost of seed, fertilizers, and bagging for the potatoes, but do not include any expense for labor. The rent is figured at $5 an acre for the time actually taken to produce the crop.

From observations during the first year's work it was clearly seen that it was possible to establish a system of diversification on plantations and that the tenants were eager to raise other things than cotton, provided the owner was willing and they had some little instruction in the care of the new crops. However, it was noticed that true diversification is possible only where the tenant lives upon the land which he tills. When this is the case he can keep live stock, raise the necessary feed, provide pastures, and attend to the little details required by a diversified farm. Where a tenant lived a few miles from his holdings he lost too much time in going back and forth and was unable to give the necessary attention to his crops.[a] Because of this loss of time the owner during the past winter has moved many of his cottages from the old "quarters" to the holdings of the tenants. Many of the houses have been remodeled. A prize is offered to the tenant showing the most taste in the improvement of his home and environments.

All the tenants were much pleased with the experiment and desired to continue it. The owner is now one of the greatest diversification enthusiasts in the South. For 1907 he has planned to diversify further by adding sugar cane, alfalfa, and other crops to his list. (See Table 3.) He also has extended the work to his adjoining plantation.

Table 3 gives the names of the tenants on Emfield and Rosalie plantations, with the acreages which they have in each crop. The larger acreage is still in cotton and corn, but there are considerable areas in ribbon cane, alfalfa, and Irish potatoes, each tenant having from 1 to 5 acres of each of these crops. Then there are smaller areas in watermelons, cabbages, and sweet potatoes.

[a] The cabbage crop referred to might have been saved had the tenants lived near enough so as to have been able to water it.

TABLE 3.—*Kinds of crops, with acreages, grown by tenants of William Polk in 1907, with number of live stock kept.*

Name of tenant and number in his family.	Cotton.	Cane.	Potatoes.	Corn and peas.	Alfalfa.	Melons.	Sorghum.	Cabbage.	Sweet potatoes.	Miscellaneous garden vegetables.	Mules.	Horses.	Cattle.	Hogs.
	Acres	*Acres*	*Acres*	*Acres*	*Acres*	*Acres*	*Acres*	*Acres*	*Acres*	*Acres*	*No.*	*No.*	*No.*	*No.*
A. Figgins (2)	22	¾	2	23	2	1	⅛	.....	⅜	¼	2	1	3	10
T. Jefferson (4)	10	2	2	8	2	¾	¼	.....	¼	¼	3	1	3	9
A. Palmer (8)	26	1¾	3	8	1¼	1	⅛	½	½	¼	1	2	....	3
I. Jackson (2)	13	½	2	7	3	1	⅛	.....	½	¼	1	.....	.....	1
A. Stracener (5)	16	3	3	15	.....	¾	¼	¼	1	1	2	1	5	5
A. Williams (6)	30	½	5	16	2	1	¼	¼	1	¼	3	1	3	8
I. Carey (8)	25	3½	4	14	2½	½	¼	¼	½	1	3	1	2	7
G. Mason (10)	20	5	5	13	2	1	½	½	1	½	2	1	4	15
P. Thompson (4)	20	6	4	12	2½	1	1	1¼	1	¼	2	4	6	4
W. Odom (10)	48	1	12	38	6½	1	½	1	2	1	7	2	14	20
T. Grimble (7)	17	1½	2	9½	2	1	.....	½	½	¼	1	1	8	10
W. Thompson (3)	15	3	3	8	1	½	¼	.....	¼	¼	1	2	4	5
J. Chase (4)	18	1¾	3½	7	1¾	1	⅛	1	½	¼	2	2	....	6
H. Edwards (8)	28	2	3¾	15	1½	1	¼	1½	1	1	3	1	5	3
E. Johnson (5)	14	½	2	10	1½	2	¼	½	½	¼	2	1	1	3
W. King (10)	17	½	2	9	2	½	¼	½	½	¼	2	1	2	3
H. Griffin (6)	15	3	4	10	2	1	¼	½	½	¼	2	1	2	10
L. Foster (9)	20	1	4	12	2	1	¼	½	½	¼	2	1	....	6
W. Boxter (5)	19	¼	2	9	1	1	¼	¼	½	¼	....	3	....	1
B. Purdy (6)	15	½	2	8	1½	1	.....	.....	¼	¼	1	1	2	7
R. Bayou (3)	13	1	2	6	1	1	¼	.....	¼	¼	2	1	....	1
M. Weldon (2)	12	⅛	2	10	.....	1	¼	1	1	1	1	1	2	3
A. Ashley (4)	12	.....	3	6	.....	½	¼	½	¼	⅛	2	....	3	5
M. Odom (2)	12	.....	2	8	.....	½	¼	.....	½	¼	1	1	4	2
J. Colletto (3)	40	.....	20	10	.....	1	.....	2	.....	½	2	2	1	....
M. Gercinto (6)	17	.....	2½	2½	.....	1	¼	3	1⅛	4	2	.....	.....	2
D. Romero (5)	26	.....	3	5	.....	¼	¼	.....	¼	1	2	.....	.....	2
S. Goodman (4)	30	5	.....	20	.....	1	1	¼	¼	¼	4	1	6	2
B. Barnado (5)	18	3	3	12	½	1	¼	¼	¼	¼	2	.....	.....	1
J. Williams (2)	15	1½	2¼	7	.....	½	¼	¼	½	¼	1	1	2	1
S. Monie (4)	25	1	3	15	1	1	¼	.....	1	¼	2	2	3	7
J. Brown (5)	27	5	1	11	3	1	¼	½	½	¼	2	1	1	16
E. Brown (9)	23	.....	4	6	.....	1	¼	¼	1	¼	2	.....	.....	2
N. Dixon (12)	40	6	5	15	2	1	¼	¼	2	¼	2	4	5	26
J. Crawford (6)	22	5	2	14	2	1	¼	½	1	¼	3	2	1	4
H. Burrel (3)	25	1	4	15	3	1	½	1	½	¼	4	....	2	1
H. Low (2)	12	.....	.....	3	.....	.....	.....	.....	⅛	¼	.....	.....	.....	2
Total	777	66⅜	129	417	52¼	32¾	10¾	19¼	27⅛	18⅜	76	44	94	213

In addition to the crops specified, three tenants had an eighth of an acre each in onions; two, one-fourth acre each in peanuts; one, one-fourth acre in sweet corn; and one, 6 acres in Johnson grass, while one tenant had three-fourths of an acre each in clover and in oats and vetch, one-half an acre each in radishes and rape, and an eighth of an acre each in tomatoes, beans, okra, and cantaloupes.

The income will be derived from Irish potatoes, watermelons, cotton, and ribbon cane, in the order given, while many of the tenants will also have small quantities of sweet potatoes, cabbages, and other truck to sell, and perhaps a little pork. In addition to this, these tenants have had their own milk, butter, eggs, and vegetables; they have raised their own poultry, pork, and hay, and at the end of the year will be much better off than when they paid out for these things all they received for the cotton crop.

CONCLUSION.

The tenant's prosperity is identical with that of the planter. It is therefore to the advantage of the planter to encourage diversified farming among his tenants. It is hoped that many planters will learn from the description of these experiments in Louisiana not only the benefits of diversification but also how to start the work. Not every one will be so situated as to follow this outline exactly, but the principle is plain and some plan can be evolved which will work equally well under other conditions.

FARMERS' BULLETINS.

The following is a list, by number, of the Farmers' Bulletins available for distribution. The bulletins entitled "Experiment Station Work" give in brief the results of experiments performed by the State experiment stations. Titles of other bulletins are self-explanatory. Bulletins in this list will be sent free to any address in the United States on application to a Senator, Representative, or Delegate in Congress, or to the Secretary of Agriculture, Washington, D. C. Numbers omitted have been discontinued, being superseded by later bulletins.

22. The Feeding of Farm Animals. Pp. 40.
24. Hog Cholera and Swine Plague. Pp. 16.
25. Peanuts: Culture and Uses. Pp. 24.
27. Flax for Seed and Fiber. Pp. 16.
28. Weeds: And How to Kill Them. Pp. 30.
29. Souring and Other Changes in Milk. Pp. 22.
30. Grape Diseases on the Pacific Coast. Pp. 15.
32. Silos and Silage. Pp. 30.
33. Peach Growing for Market. Pp. 24.
34. Meats: Composition and Cooking. Pp. 31.
35. Potato Culture. Pp. 24.
36. Cotton Seed and Its Products. Pp. 16.
39. Onion Culture. Pp. 30.
42. Facts About Milk. Pp. 32.
44. Commercial Fertilizers. Pp. 38.
46. Irrigation in Humid Climates. Pp. 27.
47. Insects Affecting the Cotton Plant. Pp. 32.
48. The Manuring of Cotton. Pp. 16.
49. Sheep Feeding. Pp. 24.
51. Standard Varieties of Chickens. Pp. 48.
52. The Sugar Beet. Pp. 48.
54. Some Common Birds. Pp. 48.
55. The Dairy Herd. Pp. 30.
56. Experiment Station Work—I. Pp. 30.
58. The Soy Bean as a Forage Crop. Pp. 24.
59. Bee Keeping. Pp. 48.
60. Methods of Curing Tobacco. Pp. 24.
61. Asparagus Culture. Pp. 40.
62. Marketing Farm Produce. Pp. 31.
63. Care of Milk on the Farm. Pp. 40.
64. Ducks and Geese. Pp. 55.
65. Experiment Station Work—II. Pp. 32.
66. Meadows and Pastures. Pp. 30.
69. Experiment Station Work—III. Pp. 32.
71. Essentials in Beef Production. Pp. 24.
72. Cattle Ranges of the Southwest. Pp. 32.
73. Experiment Station Work—IV. Pp. 32.
74. Milk as Food. Pp. 39.
77. The Liming of Soils. Pp. 24.
78. Experiment Station Work—V. Pp. 32.
79. Experiment Station Work—VI. Pp. 27.
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